

Schotia brachypetala—a nectar cornucopia for birds

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***Schotia brachypetala*—corne d'abondance de nectar pour les oiseaux.** *Schotia brachypetala* fleurit au printemps et en début d'été et produit copieusement du nectar qui attire de nombreux nectarivores aviens spécialistes et opportunistes. Vingt-huit espèces d'oiseaux ont été observées en septembre–octobre 2011 se nourrissant du nectar de deux arbres en fleur, l'un dans la province de Limpopo et l'autre dans la province de Gauteng, en Afrique du Sud. Grâce à nos observations, augmentées par une recherche de la littérature et des données complémentaires d'autres observateurs, on dénombre maintenant 54 espèces d'oiseaux qui s'alimentent du nectar de *S. brachypetala*. Cette note souligne une fois de plus la diversité des nectarivores généralistes et opportunistes en Afrique australe.

Summary. *Schotia brachypetala* flowers in spring and early summer and produces copious nectar that attracts numerous specialist and opportunistic nectar-feeding bird species. Twenty-eight bird species were observed feeding on the nectar of two flowering trees, one in Limpopo province and another in Gauteng province, both in South Africa, during September–October 2011. Together with our observations, a literature search and additional reports from other observers brings the total number of bird species recorded feeding on *S. brachypetala* to 54 species. This note further emphasises the diversity of generalist or opportunistic nectarivores in southern Africa.

S*chotia brachypetala* Sond. (family Fabaceae or Leguminosae) is a widespread tree species in southern African savannas. The common name, Weeping Boerbean, most aptly describes the tree that produces copious amounts of nectar that even drips out of the flowers. The flowering period occurs during spring and in any individual tree is generally short (*c.* 2 weeks) (van Wyk & van Wyk 1997, Boon 2010). This appears to be slightly different to *S. afra* var. *afra* which occurs in south-eastern South Africa; it flowers mainly during July–October, although flowers have been collected in every other month of the year (van Wyk & van Wyk 1997; B. van Wyk pers. comm.). These two flowering strategies may benefit birds in different ways; the longer flowering period of *S. afra* may provide smaller amounts of nectar to birds over a longer period (Skead 1967) whilst an abundance of nectar in *S. brachypetala* over a shorter period may supply birds with food following a lean winter period.

The nectar of *S. brachypetala* is described in many field guides as an important food for birds, particularly sunbirds (e.g. van Wyk & van Wyk 1997). However, reports describing specific feeding accounts are few or are hidden in 'grey literature'. Skead (1967) reported specifically on the importance of *Schotia* spp. nectar for sunbirds and Palmer & Pitman (1972) reported broadly on the importance of four *Schotia* species for animals. Here we report nectar feeding by birds at two

S. brachypetala trees in South Africa, and collate additional records of feeding on this species, and on other *Schotia* spp. as reported by Skead (1967).

During 23–26 September 2011 a single flowering tree at Wits Rural Facility (WRF), Limpopo province (24°33'11"S 31°05'48"E), was observed opportunistically during daylight hours for nectar-feeding visitors. During the observation period the tree was covered profusely in mature flowers and nectar literally dripped from the tree. We also made additional opportunistic observations at a *S. brachypetala* tree flowering at the University of the Witwatersrand campus in central Johannesburg, Gauteng province (26°11'27"S 28°01'56"E), during 27 September–18 October 2011.

Overall we recorded 28 bird species feeding on nectar, 20 of which were photographed (Table 1). An additional five species were recorded in the tree at WRF, but not seen directly probing for nectar. Three of these species, Green Woodhoopoe *Phoeniculus purpureus*, Southern Boubou *Laniarius ferrugineus* and Southern Black Tit *Parus niger* are known to be nectar feeders but were not recorded feeding on *S. brachypetala*, whilst two species, Cardinal Woodpecker *Dendropicos fuscescens* and Chinspot Batis *Batis molitor*, were seen in the tree during the flowering period but not seen (or previously recorded) feeding on nectar. In addition we also observed several Tree Squirrels *Paraxerus cepapi* feeding on nectar and



Figure 1. Some species feeding on nectar of *Schotia brachypetala* (a) Yellow-rumped Tinkerbird *Pogoniulus bilineatus*; (b) Black-headed Oriole *Oriolus larvatus*; (c) Terrestrial Brownbul *Phyllastrephus terrestris*; (d) Arrow-marked Babbler *Turdoides jardineii*; (e) Tawny-flanked Prinia *Prinia subflava*; (f) Kurrichane Thrush *Turdus libonyanus*; (g) Collared Sunbird *Hedydipna collaris*; (h) Lesser Masked Weaver *Ploceus intermedius*; (i) Red-headed Weaver *Anaplectes rubriceps*; (j) Thick-billed Weaver *Amblyospiza albifrons*; (k) Yellow-fronted Canary *Serinus mozambicus*; (l) Tree Squirrel *Paraxerus cepapi* (K. Yoganand)

Quelques espèces s'alimentant du nectar de *Schotia brachypetala* (a) Barbion à croupion jaune *Pogoniulus bilineatus*; (b) Loriot masqué *Oriolus larvatus*; (c) Bulbul jaboteur *Phyllastrephus terrestris*; (d) Cratérope fléché *Turdoides jardineii*; (e) Prinia modeste *Prinia subflava*; (f) Merle kurrichane *Turdus libonyanus*; (g) Souimanga à collier *Hedydipna collaris*; (h) Tisserin intermédiaire *Ploceus intermedius*; (i) Tisserin écarlate *Anaplectes rubriceps*; (j) Amblyospize à front blanc *Amblyospiza albifrons*; (k) Serin du Mozambique *Serinus mozambicus*; (l) Écureuil des bois *Paraxerus cepapi* (K. Yoganand)

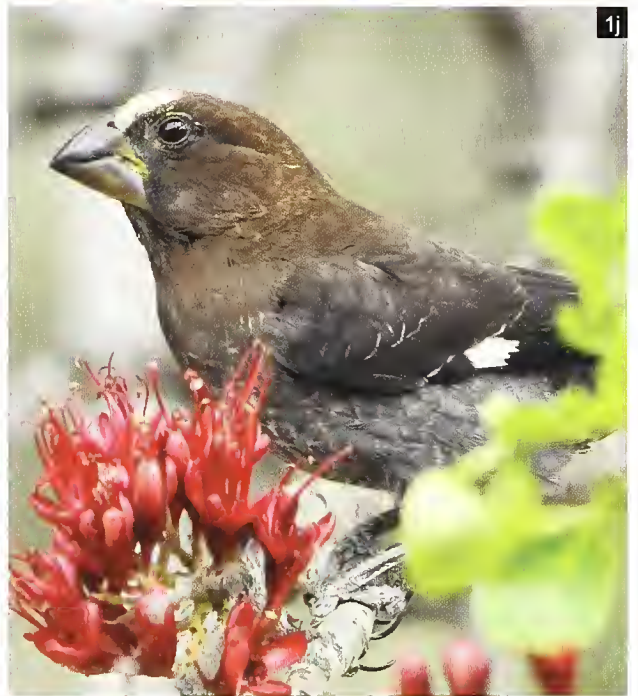


Table 1. Bird species recorded feeding on nectar in flowers of *Schotia brachypetala*.

Tableau 1. Espèces d'oiseaux observées s'alimentant de nectar des fleurs de *Schotia brachypetala*. L'ordre et la taxonomie suivent Hockey *et al.* (2005).

Sources: 1 = Skead (1967) attributes some records to *S. afra* and *Schotia* in general; 2 = Stidolph (1969); 3 = Palmer & Pitman (1972); 4 = Berruti (1989); 5 = Johnson (1989); 6 = Dinkelmann & Dinkelmann (1998); 7 = Hoddinot (1998); 8 = A. Craig pers. comm.; 9 = G. Nichols pers. comm.; 10 = M. Kriek pers. comm.; 11 = S. Boardman pers. comm.; WRF = observed feeding on *S. brachypetala* nectar during this study at Wits Rural Facility (Limpopo province); Jhb = birds observed feeding on *S. brachypetala* nectar at University of the Witwatersrand campus in Johannesburg (Gauteng province). Sequence and taxonomy follow Hockey *et al.* (2005).

Species	Source
Lybiidae	
Yellow-rumped Tinkerbird <i>Pogoniulus bilineatus</i>	WRF
Red-fronted Tinkerbird <i>Pogoniulus pusillus</i>	5
Black-collared Barbet <i>Lybius torquatus</i>	5, WRF
Crested Barbet <i>Trachyphonus vaillantii</i>	11
Phoeniculidae	
Green Wood-hoopoe <i>Phoeniculus purpureus</i>	9
Rhinopomastidae	
Common Scimitarbill <i>Rhinopomastus cyanomelas</i>	WRF
Coliidae	
Speckled Mousebird <i>Colius striatus</i>	WRF
Red-faced Mousebird <i>Urocolius indicus</i>	8
Psittacidae	
Brown-headed Parrot <i>Poicephalus cryptoxanthus</i>	6, 7
Oriolidae	
Black-headed Oriole <i>Oriolus larvatus</i>	8, 11, WRF
Dicruridae	
Fork-tailed Drongo <i>Dicrurus adsimilis</i>	WRF
Malaconotidae	
Southern Boubou <i>Laniarius ferrugineus</i>	11
Pycnonotidae	
Dark-capped Bulbul <i>Pycnonotus tricolor</i>	5, 11, WRF
Sombre Greenbul <i>Andropadus importunus</i>	5, WRF
Terrestrial Brownbul <i>Phyllastrephus terrestris</i>	WRF
Sylviidae	
Long-billed Crombec <i>Sylvietta rufescens</i>	WRF
Arrow-marked Babbler <i>Turdoides jardineii</i>	WRF
Zosteropidae	
African Yellow White-eye <i>Zosterops senegalensis</i>	9
Cape White-eye <i>Zosterops capensis</i>	2, 5, 8, WRF, Jhb
Cisticolidae	
Tawny-flanked Prinia <i>Prinia subflava</i>	5, WRF

Yellow-breasted Apalis <i>Apalis flavida</i>	5, 6, WRF
Muscicapidae	
Kurrichane Thrush <i>Turdus libonyanus</i>	5, WRF
Karoo Thrush <i>Turdus smithi</i>	Jhb
African Dusky Flycatcher <i>Muscicapa adusta</i>	5
Cape Robin Chat <i>Cossypha caffra</i>	5
Sturnidae	
Red-winged Starling <i>Onychognathus morio</i>	6, Jhb
Black-bellied Starling <i>Lamprotornis corruscus</i>	5, 6
Cape Glossy Starling <i>Lamprotornis nitens</i>	5, 6, WRF
Burchell's Starling <i>Lamprotornis australis</i>	3
Wattled Starling <i>Creatophora cinerea</i>	6
Common Myna <i>Acridotheres tristis</i>	10
Nectariniidae^a	
Eastern Olive Sunbird <i>Cyanomitra olivacea</i>	9
Grey Sunbird <i>Cyanomitra veroxii</i>	1, 2, 6
Amethyst Sunbird <i>Chalcomitra amethystina</i>	1, 5, 8
Scarlet-chested Sunbird <i>Chalcomitra senegalensis</i>	1, 2, 5, 6, 11
Collared Sunbird <i>Hedydipna collaris</i>	2, 5, 6, WRF
Southern Double-collared Sunbird <i>Cinnyris chalybeus</i>	1
Greater Double-collared Sunbird <i>Cinnyris afer</i>	1
Neergaard's Sunbird <i>Cinnyris neergaardi</i>	2, 4
White-bellied Sunbird <i>Cinnyris talatala</i>	1, 2, 5, 6, WRF
Marico Sunbird <i>Cinnyris mariquensis</i>	1, 5, 6, 11
Purple-banded Sunbird <i>Cinnyris bifasciatus</i>	2, 5, 6, 11
Ploceidae	
Lesser Masked Weaver <i>Ploceus intermedius</i>	5, WRF
Spectacled Weaver <i>Ploceus ocularis</i>	5, WRF
Cape Weaver <i>Ploceus capensis</i>	5, 8
Southern Masked Weaver <i>Ploceus velatus</i>	Jhb
Village Weaver <i>Ploceus cucullatus</i>	5, WRF
Red-headed Weaver <i>Anaplectes rubriceps</i>	WRF
Thick-billed Weaver <i>Amblyospiza albifrons</i>	WRF
Estrildidae	
Red-backed Mannikin <i>Spermestes bicolor</i>	2
Passeridae	
Southern Grey-headed Sparrow <i>Passer diffusus</i>	WRF
Fringillidae	
Forest Canary <i>Serinus scotops</i>	11
Yellow-fronted Canary <i>Serinus mozambicus</i>	WRF
Streaky-headed Seedeater <i>Serinus gularis</i>	11

^a The number of sunbirds feeding on *S. brachypetala* nectar may be under-represented but this summary reviews only the published literature of birds specifically feeding on nectar of *S. brachypetala*.

Vervet Monkeys *Chlorocebus pygerythrus* nearby. Vervet Monkeys and Chacma Baboons *Papio hamadryas ursinus* have been recorded feeding on *Aloe marlothii* nectar, and South African Large Spotted Genet *Genetta tigrina* on *Maranthes polyandra*; so *S. brachypetala*, like other nectar-abundant plants, may be an important food and / or water source for other mammal species (Lack 1977, 1978, Symes *et al.* 2008, Symes 2010, Symes *et al.* 2011).

A literature search for the occurrence of nectar feeding by birds, observations from other competent birders, and our own observations brings the total number of bird species recorded feeding on *S. brachypetala* to 54. However, this list is by no means exhaustive, and we suggest, given further investigation, that many more species will be added to it. Some of the species on the list may be questionable, especially those cited by only one reference. However, given that they may either (1) belong in a family where many other members are recorded nectar feeders (on nectar of *S. brachypetala* or other species, e.g. African Dusky Flycatcher *Muscicapa adusta*), or (2) they are recorded feeding on the nectar of other plant species, e.g. Red-backed Mannikin *Spermestes bicolor* feeding on *Callistemon viminalis* nectar (G. Nichols pers. obs.), we have retained them in the list.

Only 11 of the observed species are specialist nectar feeders, i.e. sunbirds, suggesting that generalist or opportunistic nectarivores (which comprise >80% of these nectar-feeding species) may also be important pollinators for *S. brachypetala*. The presence of six species of starlings, including Burchell's Starling *Lamprotornis australis* which has been recorded feeding on flowers (Palmer & Pitman 1972) suggests that the nectar is fructose dominated (members of two lineages, the Sturnidae–Mimidae–Turdidae–Muscicapidae and Furnariidae, appear to lack the enzyme sucrase and therefore cannot assimilate sucrose: Martínez del Río & Stevens 1989, Martínez del Río *et al.* 1992, Lotz & Schondube 2006). Because the flowers are relatively exposed, and nectar that does not drip out can potentially evaporate, measurements of nectar volume and concentration were expected to vary. In samples collected early in the morning at a tree in the University of the Witwatersrand campus, Johannesburg, in a position where it is seldom artificially watered, nectar concentration

in flowers with large volumes of nectar (volume >150 µl, $n = 3$) measured 15–19% w/w (mass sugar / mass water %; measured with a hand-held refractometer; Bellingham & Stanley, Tunbridge Wells, UK). Nicolson (2002) confirmed that the nectar contains 0% sucrose and that mean nectar concentration was $11.3 \pm 2.5\%$ (mean \pm SD, $n = 21$). This compares favourably with the hypothesis that plants producing nectars of high volume (40–100 µl/flower) and low concentration (8–12% w/w) attract generalist bird pollinators (Johnson & Nicolson 2008). In flowers where nectar may have become evaporated or reabsorbed, volumes were much lower (<100 µl, $n = 3$) and concentrations higher (37% w/w).

This article furthermore highlights the diversity of opportunistic nectar-feeding bird species in southern Africa. *Aloe marlothii* has previously been shown to be an important food source for a diverse range of bird species (Symes 2010, Symes *et al.* 2011). In addition, several trees with red flowers, e.g. *Bombax*, *Erythrina*, *Parkia*, similarly attract large numbers of birds elsewhere in Africa (Pettet 1977, Jacot Guillarmod *et al.* 1979; F. Dowsett-Lemaire *in litt.* 2012). Equally the nectar of flowering *S. brachypetala* and the attraction it has for many species of birds may suggest that it is an important food and / or water source for numerous species; these interactions warrant further attention from researchers.

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